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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/503,089	02/11/2000	Amanda J. Patel	1030-R-00	6089

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EXAMINER	
CANELLA, KAREN A	

ART UNIT	PAPER NUMBER
1642	

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/503,089	PATEL ET AL.	
	Examiner	Art Unit	
	Karen A Canella	1642	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-16,18-20,22,23 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-16,18-20,22 and 25* is/are rejected.

7)☒ Claim(s) *23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 18, 19, 20 and 22 have been amended. Claims 1-12 have been canceled. Claims 13-16, 18-20, 22, 23 and 25 are pending and under consideration.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Claim 23 is objected to for the following formalities: the claim recites "molecule encoding (SEQ ID NO:5)" instead of "molecule encoding SEQ ID NO:5.. Appropriate correction is required.

The rejection of claims 18, 22 and 25 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is maintained. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention is maintained for reasons of record

Claim 18 is drawn to a method dependent upon the identity of the TREK-1 protein. Claims 22 and 25 are method claims dependent upon the identity of the TASK protein. The TREK-1 and the TASK proteins of the claims encompass a genus of proteins which exhibit outward-going potassium rectification. Applicant has introduced the limitations of "encoding a potassium channel...having two pore domains and four transmembrane segments" and wherein "TREK-1 is selectively activating by chloroform, diethyl ether, halothane and isoflurane" and wherein "TASK is selectively activated by halothane and isoflurane" in an attempt to provide both structural and functional attributes for the claimed genuses of TREK and TASK proteins. However, the genuses of both parent compounds, TREK-1 and TASK are still highly variant in terms of amino acid sequence because numerous potassium channels have two pore domains and four transmembrane segments as evidenced by the instant Figure 1 which includes TRAAK and TWIK with TREK and TASK in potassium channels having two pore domains and

four transmembrane segments. Thus, it is reasonably concluded that having tow pore domains and four transmembrane segments are not structural attributes which uniquely characterize TREK-1 or TASK and further, these are the same structural attributes that encompass claims drawn to either TREK-1 and TASK. The genuses encompass homologous and orthologous proteins having the stated functional attributes. Thus, the disclosure of SEQ ID NO:2 and 4 for the TREK-1 genus and the disclosure of SEQ ID NO:5 fro the TASK genus does not suffice to adequately describe the claimed genuses because numerous deviations from the amino acid sequence and therefore encompasses proteins that differ substantially in amino acid sequence from SEQ ID NO:2 and 4, in the case of TREK-1, and SEQ ID NO:5 in the case of TASK. The specification states that the sequence of TREK-1 may be any amino acid sequence that is substantially identical to TREK-1. The specification does not define the limits of what is substantially identical to TREK-1 versus not substantially identical to TREK-1. Thus, the recitation of TREK-1 reads on any number of structural alterations and variants of TREK-1 that have not been disclosed. The disclosure of SEQ ID NO:2 and 4 does not describe the genus of TREK-1, nor does the disclosure of SEQ ID NO:5 describe the genus of TRAK because the genus includes numerous amino acid sequence variants which differ from SEQ ID NO:2, 4 and 5. Thus, the specification lacks adequate written description for a genus of TREK-1 and a genus of TRAK. It is reasonably concluded that claims drawn to a method of using a product cannot be adequately described if the product itself has not been adequately described. Therefore, one of skill in the art would reasonably conclude that applicant was not in possession of the claimed genus upon which the method claims depend.

The rejection of claims 13-16, 18-20 under 35 U.S.C. 102(a) as being anticipated by Patel et al (Nature Neuroscience, 1999, Vol. 2, pp. 422-426) is maintained for reasons of record.

Claim 13 is drawn to a method for identifying substances having anesthetic properties, wherein said substances produce a reversible state of consciousness with amnesia and analgesia in a mammal upon inhalation, said method comprising contacting

said substances with TREK-1 or TASK or variants of TREK-1 or TASK having at least 95% sequence identity to SEQ ID NO:2 , 4 or 5, wherein SEQ ID NO:2, 4 or 5 are mammalian transport proteins which exhibit outward-going potassium rectification, and determining the potassium transport of said TREK-1 or TASK protein wherein an activation of potassium transport activity is indicative that said substance has anesthetic properties. Claims 14 and 15 embody the method of claim 13 wherein said potassium transport proteins is TASK or TREK-1 , respectively. Claim 16 embodies the method of claim 15 wherein said TREK-1 comprises either SEQ ID NO:2 or SEQ ID NO:4. Claim 18 is drawn to a method for identifying substances having anesthetic properties wherein said substance produce a reversible state of consciousness with concurrent amnesia and analgesia upon inhalation be a mammal comprising contacting said substance with COS cells wherein said COS cells are transfected with a nucleotide vector comprising a nucleic acid molecule encoding TREK-1 wherein said COS cells transiently express said TREK-1 and wherein said TREK-1 exhibits outward going potassium rectification; and determining the potassium transport activity of said TREK-1 wherein an activation of potassium transport is indicative of said substance having anesthetic properties. Claim 19 is drawn to a method for identifying substances having anesthetic properties wherein said substance produce a reversible state of consciousness with concurrent amnesia and analgesia upon inhalation be a mammal comprising contacting said substance with COS cells wherein said COS cells are transfected with a nucleotide vector comprising SEQ ID NO:2, wherein said COS cells transiently express the protein encoded by SEQ ID NO:2 and wherein said protein exhibits outward going potassium rectification; and determining the potassium transport activity of said protein wherein an activation of potassium transport is indicative of said substance having anesthetic properties. Claim 20 is drawn to a method of identifying substances having anesthetic properties wherein said substance produce a reversible state of consciousness with concurrent amnesia and analgesia upon inhalation be a mammal comprising contacting said substance with COS cells wherein said COS cells are transfected with a nucleotide vector comprising SEQ ID NO:4, wherein said COS cells transiently express the protein encoded by SEQ ID NO:4 and wherein said protein exhibits outward going potassium rectification; and determining the

potassium transport activity of said protein wherein an activation of potassium transport is indicative of said substance having anesthetic properties.

Patel et al disclose a method for identifying substances having anorthic properties upon inhalation comprising contacting said substance with TREK-1 (mouse and human) or TASK expressed on the surface of COS cells (pages 422-425, under "Results"). It is noted that human TREK-1 is SEQ ID NO:2 and mouse TREK-1 is SEQ ID NO:4 and that activation of potassium transport in the TREK-1 or TASK proteins was observed by outward-going potassium rectification (page 423, second column, lines 3-6).

The rejection of claims 13-16, 18 and 20 under 35 U.S.C. 103(a) as being unpatentable over Franks and Lieb (Nature, 1988, vol. 333, pp. 662-664, cited in a previous Office action) in view of Patel et al (EMBO, 1998, Vol. 17, pp. 4283-4289, reference AN of the IDS filed February 11, 2000) are maintained for reasons of record. The specific embodiments of the claims are recited above.

Franks and Lieb teach a direct correlation between the presence of an anesthetic-induced current, Ik(an) and anesthetic-induced inhibition of spontaneous firing in a given neurons and that those neurons which were insensitive to anesthesia lacked the Ik(an) current while said current was always present in a sensitive cell. Franks and Leib teach that such anesthesia activated potassium channels have just the properties that might be expected for the principle target sites involved in general anesthesia (page 664, first column, lines 34-36).

Patel et al teach that TREK-1 encodes a mammalian mechano-activated potassium channel which shares most of the properties of the Aplysia S-type potassium channel (page 4283, second column, last 4 lines). Patel et al compare the opening of the TREK-1 potassium channel by chloroform with the opening of the Aplysia channel by chloroform (page 4286, bridging paragraph and legend for Figure 1). Patel et al especially note that the I-V curve of the chloroform activated current in TREK-1 is identical to the AA-sensitive current. Further both the Aplysia S channel and the TREK-1 channel are both mechano-activated (page 4285, second column, lines 16-21). It is noted that Patel et al teach mouse TREK-1 which is SEQ ID NO:4

It would have been prima facie obvious to one of skill in the art at the time the invention was filed to substitute the measurement of the Ik(an) current in TREK-1 for the measurement of the Ik(an) current of the Aplysia-S channel. One of skill in the art would be motivated to do so by the teachings of Patel et al on the similarities between the current induced by anesthesia in the TREK-1 potassium channel and the current induced by the Aplysia S channel in response to general anesthetics. One of skill in the art would be motivated to identify substances having the property of inducing said Ik(an) current by the teachings of Franks and Lieb on the targeting of said current by general anesthesia and additionally because the mammalian homolog of the Aplysia S-channel would be more appropriate in the screening of said substances, as one of skill in the art would recognize that said substance would the have the potential of being used clinically to induce reversible unconsciousness in a mammalian subject.

Applicant has requested a change of inventorship stating that Michael Fink was inadvertently left off the list of inventors. However, the Written Consent of the Assignee" and the "Statement by Additional Inventor" are unsigned. Further, in the event that these Statements were executed, the above rejections would still be maintained. The rejection of claims 3-16, 18-20 under 35 U.S.C. 102(a) as being anticipated by Patel et al (Nature Neuroscience, 1999, Vol. 2, pp. 422-426) would be maintained because the inventive entity would differ from the instant inventive entity. The inventive entity of Patel (1999) is Patel, Honore, Maingret, LeSage, Fink, Duprat and Lazduski. The inventive entity of Patel (1998) is Patel, Fink, LeSage, Reyes, Romey, Heurteaux and Lazdiski. The instant inventive entity would be Fink, Patel, Honore, LaSage, Romey and Lazduski if the change of inventorship were properly executed. Thus, the inventive entities would differ from the instant inventive entity even if M Fink was an inventor.

All other rejections and objections as set forth in the previous Office action are withdrawn

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen A Canella whose telephone number is (571)272-0828. The examiner can normally be reached on 10 a.m. to 9 p.m. M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Siew can be reached on (571)272-0787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karen A. Canella, Ph.D.
8/9/2004

Karen A. Canella
KAREN A. CANELLA PH.D
PRIMARY EXAMINER